

greater rate than the prior art systems. The arcuate configuration of path 191 may result in a continuously varying rate of movement and distance traveled by trolley 132 as a function of the change in the pivot angle. The movement of the trolley 132 as a function of the change in the pivot angle as cam follower 202 moves along arcuate path 191 may be represented by the graph of FIG. 13. As shown, trolley 132 may undergo a first motion A as cam follower 202 moves out of detent section 230 and a second motion B as cam follower 202 moves along arcuate portion 191. As can be seen in second motion B, trolley 132 moves a greater distance and at a greater rate as the pivot angle increases. That is, as the cam follower 202 moves along the arcuate path 191 toward the end portion 1195, the relation between the distance traveled and the rate of travel in response to a change of the pivot angle changes.

[0058] As the towing vehicle 108 straightens out and returns from a turning position to a straight ahead position (aligned with the towed vehicle) the change in the pivot angle will move cam follower 202 forward along the cam path 170 toward detent 230. The fifth wheel head 136, pivot shaft 140 and cam follower 202 will all pivot back towards a straightened position and trolley 132 will move forward. Once the towing vehicle 108 straightens out a sufficient distance, the cam follower 202 may engage the detent 230 of the cam plate 162.

[0059] Additional embodiments of an automatic rolling fifth wheel hitch according to the present teachings are described below. In the descriptions, all of the details and components may not be fully described or shown. Rather, the features or components are described and, in some instances, differences with the above-described embodiments may be pointed out. Moreover, it should be appreciated that these additional embodiments may include elements or components utilized in the above-described embodiments although not shown or described. Thus, the descriptions of these additional embodiments are merely exemplary and not all-inclusive nor exclusive. Moreover, it should be appreciated that the features, components, elements and functionalities of the various embodiments may be combined or altered to achieve a desired automatic rolling fifth wheel hitch without departing from the spirit and scope of the present teachings.

[0060] An automatic rolling fifth wheel hitch 300 is shown in FIGS. 14-16. The automatic rolling fifth wheel hitch 300 may attach to a load bed 104 of a towing vehicle 108 in any appropriate manner. The automatic rolling fifth wheel hitch 300 may include a base frame 320 selectively secured to the rail members 112. The base frame 320 may include at least one bracket 324, including, without limitation two pairs of brackets 324 attached thereto. The brackets 324 may attach with the rail members 112 through the use of fasteners (not shown).

[0061] The automatic rolling fifth wheel hitch 300 may include a trolley 332 operatively engaged with the base frame 320 as described in more detail below. The automatic rolling fifth wheel hitch 300 may further include a fifth wheel head 336 pivotally attached with the trolley 332. The fifth wheel head 336 may be of any appropriate configuration such that a king pin of a towed vehicle may operatively engage with the fifth wheel head 336 resulting in the towing vehicle 108 being capable of towing the towed vehicle.

[0062] The fifth wheel head 336 may be pivotally attached with the trolley 332 through use of a pivot shaft 340. The

fifth wheel head 336 may be attached with the pivot shaft 340 in any appropriate manner. By way of a non-limiting example, the fifth wheel head 336 may be attached with the pivot shaft 340 through the use of fasteners, welding, or the like. The fifth wheel head 336 attached with the pivot shaft 340 may result in the fifth wheel head 336 being pivotable with respect to the base frame 320. The pivoting of the fifth wheel head 336 may allow the towed vehicle to pivot with respect to the towing vehicle 108 during operation. Therefore, as the towing vehicle 108 turns, the fifth wheel head 336 may pivot independently of the towing vehicle 108. This may permit the towed vehicle to turn more efficiently and effectively.

[0063] The trolley 332 may be shaped and sized to generally extend with the base frame 320 and may include a portion of which that extends within a channel 358 of the base frame 320. More specifically, the trolley 332 may include a body 374 that may be shaped and sized to extend between the base frame 320. The trolley 332 may include a plurality of rollers or wheels 378 rotatably attached to the body 374 in any appropriate manner. By way of a non-limiting example, four rollers 378 may be used—although any appropriate number of rollers may be used without departing from the present teachings.

[0064] The rollers 378 may be shaped and sized to operatively roll along the channels 358 of the base frame 320. The rollers 378 may be formed from a generally rigid material that has an effective coefficient of friction such that the rollers 378 may roll along the channel 358 generally freely. Further, the rollers 378 may be of a material that generally prevents inappropriate wear during use of the automatic rolling fifth wheel hitch 300 and is able to carry the load of the automatic rolling fifth wheel hitch 300 during operation.

[0065] The automatic rolling fifth wheel hitch 300 may include a plate member 381 attached with the base frame 320 in any appropriate manner, including, without limitation through welding, fastening or the like. Further, a linkage 385 may be operatively secured with the fifth wheel head 336 through the pivot shaft 340 and the plate member 381. As shown in FIGS. 14-15, the linkage 385 may include a first arm 387 fixedly attached with the pivot shaft 340 and fifth wheel head 336. By way of a non-limiting example, the first arm 387 may be fixedly attached with the pivot shaft 340 such as through the use of a plurality of fasteners 389. The first arm 387, however, may be fixedly attached with the pivot shaft 340 and fifth wheel head 336 in any appropriate manner and is not limited to the fasteners 389 shown. First arm 387 may act as a bell crank.

[0066] The linkage 385 may further include a second arm 391. The second arm 391 may be pivotally attached between the first arm 387 and the plate member 381. By way of a non-limiting example, the second arm 391 may be pivotally attached with the first arm 387 at pivot 393, such as through use of a fastener 395. Any appropriate fastener 395 may be used without departing from the present teachings. The second arm 391 may also be pivotally attached with the plate member 381 at a second pivot 397, such as through use of a fastener 399. Any appropriate fastener 397 may be used without departing from the present teachings. In some embodiments, the fastener 395 may be substantially similar to the fastener 399 or they may be different.

[0067] In operation, when the towing and towed vehicles are generally aligned, the first and second arms 389, 391 of the linkage 385 may remain generally aligned. As the towing